

Ahilesh Vadivel

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SUMMARY

Robotics M.S. graduate (GPA 4.0, Northeastern, May 2026) with hands-on experience across the robotics stack: perception, planning, control, manipulation, SLAM, and simulation. Published co-author on soft robotic manipulation research; deployed ROS2 systems on real hardware; trained and integrated ML models for sim-to-real deployment; and implemented robotics algorithms directly from research papers. Strong C++ and Python skills with experience spanning embedded systems, sensor integration, and production-quality software. Available immediately (F-1 OPT).

EDUCATION

Northeastern University (Boston, MA) May 2026
Master of Science in Robotics, Electrical and Computer Engineering Concentration GPA: 4.0/4.0
Anna University, College of Engineering (Chennai, India) Apr 2024
Bachelor of Engineering in Electrical and Communication Engineering

TECHNICAL SKILLS

Languages	C++, Python, MATLAB, Arduino
Perception	OpenCV, PyTorch, ResNet18/ViT, CNN classification, transfer learning, calibration, point clouds
SLAM / Nav	slam_gmapping, AMCL, move_base, multirobot_map_merge, scan matching, RANSAC
Control	PID, input-output feedback linearization, HZD, Lagrangian dynamics, system identification
ML / RL	PPO, Gymnasium, sim-to-real transfer, domain randomization, MuJoCo, Gazebo, Isaac Sim (familiar)
ROS2 / Infra	ROS2, ROS, multi-node launch systems, rosbag, sensor drivers, Linux (Ubuntu), Git
Hardware	UR3 Arm, TurtleBot3, RGBD cameras, Raspberry Pi, Arduino, Pneumatic Actuators, Custom PCBs
Tools	Fusion 360, scikit-learn, OpenCV, Rviz, Gymnasium

EXPERIENCE

PARSES Labs, Northeastern University (Boston, MA) Jan 2025 to Dec 2025
Graduate Research Assistant

- Architected and maintained ROS2 multi-node software stack in C++ and Python for a 4-DOF soft origami arm: sensor drivers, topic architecture, actuator control, and rosbag data pipeline; diagnosed and resolved latency and integration faults across perception, control, and hardware subsystems
- Integrated Kresling soft grippers with UR3 arm for in-hand manipulation; implemented and iterated actuation algorithm through 20+ hardware trials achieving 85% success rate; co-developed PID controller for vacuum pressure regulation achieving published results: below 5mm position error in 2D/3D with 680g payload (Soft Robotics Journal)
- Designed structured validation framework of 10+ test protocols to detect hardware degradation and control failures; conducted system identification experiments characterizing soft actuator dynamics

CSIR Central Scientific Instruments Organization (Chennai, India) Jul 2022 to Aug 2022
Research Student

- Resolved sensor pipeline instability in a vaccine cold-chain prototype; designed custom PCB integrating ACS712 current and AD623 voltage sensors; validated fix through comparative testing

PROJECTS

[Terrain-Aware Visual Perception for Quadruped Locomotion](#), Northeastern University Feb 2026 to Apr 2026

- Built end-to-end perception pipeline: generated 6,000-image synthetic dataset via MuJoCo procedural rendering; trained ResNet18 to 100% test accuracy at 2.19ms GPU inference; integrated terrain probability output into PPO locomotion policy; conducted sim-to-real transfer study on 60 real-world photographs recovering accuracy from 65% to 100% via domain randomization

[Bipedal Locomotion Modelling and Control](#), Northeastern University Mar 2026 to May 2026

- Derived full Lagrangian hybrid dynamics for a three-link biped (D/C/G matrices, swing-phase ODEs, impact reset maps); synthesized periodic gaits via constrained nonlinear optimization over the HZD manifold; designed nonlinear controller via input-output feedback linearization; verified exponentially stable limit-cycle walking through Poincare return map analysis

[Multi-Robot SLAM and Autonomous Navigation](#), Northeastern University Oct 2024 to Dec 2024

- Deployed SLAM-based navigation for two TurtleBot3 robots using slam_gmapping, AMCL, and move_base; designed namespace hierarchy and TF frame isolation; built map-merging pipeline with Rviz monitoring dashboard for real-time fleet-level localization validation

[Neural Network Controller Verification \(FBRA\)](#), Northeastern University Nov 2025 to Dec 2025

- Re-implemented Forward-Backward Reachability Analysis from a research paper using interval bound propagation and LP-based reachability; 100% conclusive safety verification across 5 controller configurations in under 1 second each

[Fast Spectral Scan Matching for Mobile Robot Localization](#), Northeastern University Mar 2025 to Apr 2025

- Re-implemented FSSM directly from a research paper achieving 106x memory reduction and 156x speed improvement via Kronecker product approximation; integrated with RANSAC pose estimation and unicycle motion model